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"La Variegana (*Olethreutes variegana* Hb) ed I Suoi Parassiti." The observations to which especial attention should be called in this connection are likely to be unnoticed by students of polyembryony, and this especial note is therefore written.

One of the parasites of *Anarsia lineatella* is *Encyrtus variicornis* Nees, a species not known to the present writer, but which was retained in the genus *Encyrtus* by Gustav Mayr in his monograph of the European Encyrtidæ. The only previous record of its rearing seems to have been by Nees, from a cell of *Eumenes coarctata*, and it now appears from the observations of Sarra that it is altogether likely that Nees's specimen came not from the larva of the *Eumenes* but from some lepidopterous larva stored in the cell.

Sarra finds that the female parasite lays eggs in the egg of the *Anarsia*; that the parasite egg gives origin to a number of larvæ which live within the larva of the *Anarsia* after it has hatched, in just the same way as do the other related larvæ as studied by Marchal and Silvestri.

The second case is that of an unnamed species of *Copidosoma* reared from the larva of *Olethreutes variegana*. Here too, the parasite eggs are laid in the eggs of the *Olethreutes* and develop in its larvæ, 68 females and 80 males being reared from a single host larva.

These observations are of interest not only as adding two species to the list of polyembryonic forms, but, since *Encyrtus variicornis* has not previously been associated with the *Copidosoma* and *Leptomastix* group of Encyrtidæ, another genus is added to the list.

L. O. HOWARD

FOUNDATIONS OF MECHANICS

IN a communication to SCIENCE of October 4, I used the term "doctrinal function" in the sense of a consistent body of postulates and theorems containing one or more undefined elements, but considered apart from any of the various interpretations that could be placed on the undefined elements. The introduction of this useful term "doctrinal func-

tion" was erroneously attributed to Bertrand Russell. It should have been attributed to Professor C. J. Keyser¹ who is the originator.

With reference to the criticisms by Professor Franklin and MacNutt, in SCIENCE of November 8, of my communication of October 4, I do not merge "identification" and "measurement," in the paper mentioned, but state that I think the distinction between them valueless in the context referred to. So far as the relation between mass and force is concerned, I was merely following Messrs. Franklin and MacNutt's words: "We prefer to define mass *quantitatively* (*italics mine*) in terms of the operation of weighing by a balance scale." Nothing other than a quantitative definition would be of value in the equation $f/a = m$.

The fundamentally defining quantities need not be the same as those kept by the Bureau of Standards. Temperature—the real temperature—is defined by Carnot engines, but they do not keep Carnot engines in the Washington bureau. Chemical affinity as measured with the help of a Weston standard cell is another example of the same thing. The verification comes from the totality of physical experience. "An experiment," says Duhem,² can never condemn (or validate) an isolated hypothesis but only a doctrine (*ensemble théorique*.)

Of course, there are other kinds of physics besides force physics, and it would be erroneous to say that any of the discussions exhausted all there is in the ideas of force, mass, etc.

PAUL J. FOX

1203 STOCK EXCHANGE,
PHILADELPHIA, PA.

TROPICAL ENERVATION

THE opinion is widespread, in northern climes, that a continuously warm climate, unbroken by sharp periodic changes, is enervat-

¹ See Keyser, "Human Worth of Rigorous Thinking," p. 254, and "Doctrinal Functions," *Jour. of Philos., Psychol. and Sci. Methods*, Vol. XV., p. 262.

² "La Théorie physique," Paris, 1906.

ing and detrimental to the white man. This opinion is substantiated by a considerable variety of evidence. Under tropical or subtropic conditions the white man, according to this theory, can not do the same amount of sustained physical or intellectual work that he accomplishes in a cold climate.

The present paper will not attempt to convert in full this theory of tropical "eneration," but merely aims to present conditions in the Hawaiian Islands as a specific instance to the contrary. The writer has resided in Hawaii for eleven years; his three children have been born there; and he has been much interested in the physiological relations of climate.

Hawaii, in the North Pacific Ocean, is subtropical. It is free from the intense humidity and heat of equatorial regions, and is cooled by trade winds that blow steadily from the northeast during most of the year. On the lowlands, where the entire population (250,000) resides, the annual thermal range is between 57° and 88° F., averaging 73° F. Honolulu, the only city in the islands (70,000 population), has an annual rainfall of about 42 inches, and a thermal range from 65° F. to 82° F.; mean temperature, 73° F.

The significant fact, which the writer wishes to strongly emphasize, is that the "white" population lives "American style," and differing in *no essential* from the mode of living customary in any northern city on the mainland. Habitation, clothing and food are essentially the same as one would find in the same class of society in Duluth, Winnipeg, Buffalo, Halifax, New York or Boston. The houses, of course, are not heated, and are somewhat more open and airy than are cold-climate houses. Otherwise they look like the houses in any American city. Summer-weight clothing, eastern style, is worn the year round. Americans wear exactly the same styles as in the eastern states. Most of the food is imported from the mainland.

The hours of labor for business men, professional men and laborers are just as long as in northern regions. The holidays and va-

cation periods are no more numerous. The lunch period is one hour, at noon, and there is no siesta. Agricultural laborers (mostly Orientals; some Caucasians, ex-Spanish and Portuguese) work in the fields the year round, with no winter rest period.

The American banker, doctor, lawyer, merchant works just as long and as diligently in Hawaii as he would or does in any northern city. A white laboring class does not exist in Hawaii. This is due, however, not to climatic conditions, but to the economic competition of cheap Oriental labor. In early days, before Hawaii was flooded with low-wage yellow labor, white men worked in the fields successfully, and with no evidence of physical deterioration.

White pupils in the public and private schools progress through the elementary, secondary and collegiate grades at the same rate as in cold climates; have essentially the same curriculum; do the same amount of study; and carry on the same kinds of recreation and athletics. Young men and women, born and educated in Hawaii, who have gone to the mainland schools (Wellesley, Vassar, Cornell, Stanford, Yale, Harvard, etc.), not only take equal rank with the other students there, but in many notable instances have shown unusual scholarship, leadership and athletic ability. White children growing up in Hawaii have much more outdoor life throughout the year than do the majority of cold-climate children. There are no Hawaiian diseases of infancy or childhood differing from those of other countries. The salubrious climate is extremely conducive to healthy infancy and childhood.

It must be acknowledged that the change from a northern to a subtropical climate does not always agree with the white woman. Some suffer from poor health, and more or less profound functional derangement. In many cases lactation is inadequate, or abnormal in other ways. A large percentage of white babies in Hawaii are bottle-fed. However, the problem is an open one, as to how much of the ill health of some white women in Hawaii is directly due to climatic maladaptation, and

how largely due to other causes. White women in Hawaii represent a highly selected class—the wives and families of capitalistic and professional classes. Many white women in Hawaii have enjoyed excellent health, have raised large families of stalwart children, and have lived to ripe old age.

On the whole, there is little evidence of tropical “enervation” or lassitude among the white population of the Hawaiian Islands. In high moral, intellectual and physical life, tone and labors, this population compares most favorably with similar groups in any northern climate. In spiritual leadership, in literary and artistic productivity, in scientific and technical research, in financial and business organization and development, in agricultural exploitation, in sport and athletics—in fact, in every notable manifestation of the human mind and body, the white man in Hawaii has achieved remarkable success. He shows no signs of deterioration; on the contrary, in his efforts toward higher civic life, and toward the establishment of a permanent white middle class on the land, he shows that he is ever progressing to higher and higher levels.

VAUGHAN MACCAUGHEY

COLLEGE OF HAWAII

SCIENTIFIC BOOKS

Stoichiometry. By SYDNEY YOUNG, D.Sc., F.R.S. New York, Longmans, Green & Co. 1918. Pp. xii + 363. With 93 figures in the text. Second Edition. Price \$3.75 net.

It is unfortunate, indeed, that general texts are not more often written by those who have done much research in the particular lines covered by the book—for the advantages of such authorship are plainly apparent in “Stoichiometry.” Certainly no name of recent time has become more intimately associated with the *precise* determination of the physical constants of the gaseous and liquid states of aggregation than that of Young; and assuredly no one can speak with more authority than he of a subject which includes them; or treat with a clearer vision the things dependent upon them.

In this edition, the new experimental work, done since the original appearance of the book, has been ably summarized and included. In other respects, all that was said in praise of the first edition may be repeated even more emphatically in the case of the second. The inclusion of complete lists or references is one thing which renders the work especially valuable to the reader, for it thus serves as a point of departure for one wishing to make a more exhaustive study of any one of its component portions.

Like the same author’s “Fractional Distillation,” this is distinctly one of those books which should have a prominent place in every chemist’s *working* library.

J. LIVINGSTON R. MORGAN

COLUMBIA UNIVERSITY

THE PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE eighth number of Volume 4 of the *Proceedings of the National Academy of Sciences* contains the following articles:

Hereditary Tendency to Form Nerve Tumors: C. B. Davenport, Station for Experimental Evolution, Carnegie Institution of Washington. The disease is not communicable. It affects blood relatives, both sexes nearly equally, and occurs without a break in the generations, about 50 per cent. of the individuals being affected. Apparently, therefore, the heredity factor in neurofibromatosis is dominant.

Arithmetical Theory of Certain Hurwitzian Continued Fractions: D. N. Lehmer, Department of Mathematics, University of California. Investigations on the successive values of the numerators and denominators of convergents.

On Closed Curves Described by a Spherical Pendulum: Arnold Emch, Department of Mathematics, University of Illinois. Some geometric properties of these curves are developed.

The Taxonomic Position of the Genus Actinomyces: Charles Drechsler, Cryptogamic